California Regional Water Quality Control Board
Santa Ana Region

April 21, 2006

Item: 15

Subject: Supplemental Staff Report: Proposed Basin Plan Amendment – Incorporation of a Nutrient Total Maximum Daily Load for Dry Hydrological Conditions for Big Bear Lake – Resolution No. R8-2006-0023

On January 17, 2006, staff made available for public review a staff report that includes a discussion of proposed changes to the draft Big Bear Lake Nutrient total maximum daily loads (TMDLs) that were presented at a public workshop on August 26, 2005. Since the release of the January 17, 2006 staff report, staff has received input from the USEPA and from Risk Sciences, Inc., representing the Big Bear Municipal Water District, San Bernardino County, San Bernardino County Flood Control District, the City of Big Bear Lake, California Department of Transportation (Cal Trans) and Big Bear Mountain Resorts, that warrants additional changes to the proposed TMDLs. Risk Sciences, Inc., does not represent the USFS, and staff anticipates that the USFS will offer additional comments prior to or at this public hearing. The need for further changes will have to be assessed at that time. This supplemental report describes additional changes that have been made to the proposed Basin Plan amendment in response to the additional comments received to date. These changes are shown in the Errata Sheet for the proposed Basin Plan amendment (Attachment to Resolution No. R8-2006-0023).

In summary, the significant proposed additional changes are:

1. Deletion of the proposed numeric target for nitrogen and the TMDL, WLAs and LAs for nitrogen for Big Bear Lake.
2. Addition of text in Section 1 of the Basin Plan Amendment ("Big Bear Lake Nutrient TMDLs") and in Section 1. B.3. ("Seasonal Variation/Critical Conditions") that explains that, since the TMDL for dry hydrological conditions was developed to meet the numeric targets under the critical, worst-case conditions, consistent compliance with these targets is expected to be achieved even in the absence of TMDLs for wet/average hydrological conditions, given the greater lake volume and dilution anticipated under wetter conditions.
3. Addition of a footnote to Table 5-9a-c noting that compliance dates for the TMDL targets for wet and/or average hydrological conditions are subject to change, based on approved TMDLs for these conditions.
4. Addition of a footnote to Task 1.2 that indicates that individual waste discharge requirements or a conditional waiver of waste discharge requirements for the Big Bear Mountain Resorts would not be necessary, provided that adequate regulatory coverage is provided by the San Bernardino County MS4 permit.
5. Revision of Finding No. 10 of Resolution No. R8-2006-0023 to acknowledge that reducing phosphorus is one of the potential methods to ensure compliance with relevant numeric and narrative water quality objectives specified in the Basin Plan. Text has also been added to describe the approach that will be used to address nitrogen, which is a limiting nutrient under certain circumstances. This

language is also included in Section 1. A. "Numeric Targets" of the Basin Plan amendment.

6. Addition of text to Finding No. 14 of Resolution No. R8-2006-0023 specifying that external load dischargers are responsible for reducing their internal nutrient loads.
7. Revision of Finding No. 31 of Resolution No. R8-2006-0023 to acknowledge that the Basin Plan Amendment becomes effective upon approval by OAL.
8. Revision of the macrophyte coverage target from 30-60% to 30-40% of the whole lake area.

Each of these changes is discussed below.

Deletion of the proposed numeric target for nitrogen and the TMDL, WLAs and LAs for nitrogen for Big Bear Lake

Staff of the USEPA indicated via teleconference on February 16, 2006 and via letter dated February 23, 2006 that they would not approve the proposed Basin Plan amendment, as released to the public on January 17, 2006, if the matter of the attainability of the proposed numeric target and TMDL for nitrogen was not addressed. The USEPA letter identified several alternative actions that could be taken.

Regional Board staff initially proposed numeric targets for nitrogen as well as phosphorus because both nutrients have been found to limit algae at different times and because both nutrients are available to floating plants such as coontail. The basis for USEPA's concern is that Board staff had not identified any means whereby the proposed nitrogen target would be achieved (a problem that staff attributes to model limitations). USEPA believes that, absent an identified mechanism whereby compliance with the nitrogen target can be assured, the TMDL would not satisfy all relevant requirements and could not be approved. USEPA suggested that, since phosphorus appears to be the primary nutrient of concern, as indicated in the proposed Basin Plan Amendment, it would be appropriate to reserve action on nitrogen pending further data collection and analyses and a demonstration that the selected target is attainable. In response, Board staff propose the deletion of the proposed numeric target, TMDL, WLAs and LAs for nitrogen. However, the proposed amendment continues to include requirements for the collection of nitrogen data, which will be used to assess the need for and nature of revisions to the TMDL to include nitrogen targets, TMDL, etc., and to assess compliance with the established Total Inorganic Nitrogen objective for Big Bear Lake (see below). The proposed Basin Plan amendment has also been revised to include language describing this nitrogen regulatory approach (see below).

Addition of text regarding compliance with the numeric targets under wet/average hydrologic conditions

Staff of USEPA expressed concern that while the proposed numeric targets are intended to apply under all hydrologic conditions, the proposed TMDLs address only the dry conditions. USEPA questioned whether the TMDLs could be approved absent a demonstration that the targets would be met consistently without reductions in external loads that occur principally during average/wet conditions. In response, language has been added to the discussion of the Big Bear Lake Nutrient TMDL in Section 1 of the Basin Plan Amendment and to the discussion of seasonal variation/critical conditions

(Section 1. B. 3 of the Amendment) to clarify Board staff's expectation that, since the proposed TMDL was developed to address the worst-case, critical conditions of dry periods, the targets are also expected to be met at other times, when there is additional inflow to Big Bear Lake and the volume of the lake and dilution are increased. Anderson and Wakefield-Schmuck (2006) note that "the observed increase in total N and P in Big Bear Lake from 2002-2004 is consistent with the lowered lake level and reduced volume" and that "the reduction of about 1 m in mean lake depth would be expected to yield a 22% increase in TN and TP concentration." Staff believes that control actions necessary to address internal loading of nutrients will address external loads on an immediate basis, without requirements for external load reductions, given that nutrient fluxes appear to result from mineralization/release from surficial material, not deeper sediments. This is not to say that future average/wet condition TMDLs will not require external load reductions. Such reductions will likely be necessary to reduce the magnitude, cost, etc., of control actions necessary to reduce internal loads over the long-term.

Addition of a footnote to Table 5-9a-c noting that compliance dates for the TMDL targets under wet and/or average hydrological conditions are subject to change based on approved TMDLs for these conditions

Risk Sciences, Inc., indicates that a compliance date for the targets under wet and/or average hydrological conditions cannot be approved until a TMDL and implementation plan are available to know what is required to comply. Regional Board staff added a footnote to Table 5-9a-c, wherein compliance dates are specified, to state that the dates shown for the wet/average hydrologic conditions are subject to change based on approved TMDLs for those conditions.

Addition of a footnote to Task 1.2 regarding permit coverage for the Big Bear Mountain Resorts

Task 1.2 requires that individual waste discharge requirements (WDRs), or a conditional waiver of WDRs, be issued for the Big Bear Mountain Resorts to incorporate nutrient allocations, compliance schedules and monitoring and reporting requirements.

Snow Summit Ski Corporation submitted comments to Regional Board staff noting that most of the ski resort acreage is either within USFS lands or within the city limits of Big Bear Lake and that they were already regulated by these entities, as well as San Bernardino County (see Comment #18 of Attachment B –Response to Comments). Staff responded that individual WDRs (or a conditional waiver therefrom) are necessary since neither the City of Big Bear Lake, San Bernardino County nor San Bernardino County Flood Control Distirict could assert comprehensive jurisdiction over discharges from the Resorts pursuant to the MS4 permit, given that portions of Snow Summit and Bear Mountain ski resorts are within Forest Service lands.

During a meeting on February 14, 2006 Snow Summit Ski Corporation raised this issue again, and the County of San Bernardino, the San Bernardino County Flood Control District and the City of Big Bear Lake were not clear about their authority to regulate all the ski resorts discharges from federal and non-federal lands and noted they would have to check with their legal counsel. Staff added a footnote to Task 1.2 to indicate that,

provided that the MS4 permit is found to provide adequate regulatory coverage, then separate WDRs would not be necessary for the Big Bear Mountain Resorts. Staff notes that confirmation of jurisdiction is not likely to be available prior to the April 21, 2006 hearing.

Revision of Finding No. 10 of Resolution No. R8-2006-0023 and Section 1. A "Numeric Targets" to acknowledge that reducing phosphorus is one of the potential methods to ensure compliance with relevant numeric and narrative water quality objectives specified in the Basin Plan and to describe the regulatory approach for nitrogen.

Risk Sciences, Inc., indicates that there are other lake management strategies that can be implemented to achieve compliance with the response targets (e.g., chlorophyll *a*) without necessarily reducing phosphorus concentrations. Board staff have revised Finding No. 10 of Resolution No. R8-2006-0023 to specify that a reduction in phosphorus is one of the potential methods to ensure compliance with relevant numeric and narrative water quality objectives specified in the Basin Plan. In addition, in response to the proposed deletion of the nitrogen targets, TMDLs, WLAs and LAs (see above), staff proposes new language in both Finding No. 10 and in Section 1. A. "Numeric Targets" of the proposed Basin Plan Amendment to acknowledge that nitrogen can be the limiting nutrient under certain circumstances, but that data and analytical limitations preclude the identification of achievable targets, TMDLs, etc., at this time. The revised text explains that nitrogen monitoring is required and that the data collected will be used to support future revision of the TMDL to incorporate nitrogen targets, etc., as necessary and appropriate.

Addition of text to Finding No. 14 of Resolution No. R8-2006-0023 specifying that external load dischargers are responsible for reducing their internal nutrient loads

On behalf of stakeholders, Risk Sciences, Inc., requested that language be added to clarify that dischargers responsible for external loading of nutrients to Big Bear Lake would be responsible for reducing their contributions to the internal nutrient load in the lake. This language has been added to Finding No. 14 of Resolution No. R8-2006-0023.

Revision of Finding No. 31 of Resolution No. R8-2006-0023 to acknowledge that the Basin Plan Amendment becomes effective upon approval by OAL

The Alaska Rule (an amendment to 40 CFR 131.21(c) through (f)) specifies that Basin Plan amendments that entail the revision of water quality standards are not considered in effect unless and until approved by USEPA. The proposed TMDL does not revise water quality standards and, consequently, would become effective after OAL approval. Finding No. 31 of Resolution No. R8-2006-0023 has been corrected to reflect this.

Revision of the macrophyte coverage target from 30-60% to 30-40% of the whole lake area

On behalf of stakeholders, Risk Sciences, Inc., requested that the percent macrophyte coverage target be changed from 30-60% on a whole lake basis to 10-30% of the littoral zone, as recommended in the final report by Leidy (Leidy, 2006). As described in detail

in the response to Risk Sciences' comment (see Comment #3 of Response to Comments received after January 17, 2006), staff is not persuaded of the merits of this recommendation for a number of reasons. Briefly, the area of the littoral zone is difficult to define; use of a percentage of the lake as whole would be easier (Anderson, 2006). In addition, Leidy's recommendation is focused on the protection of fisheries, but does not appear to take into consideration the potential effects of his recommended reduction in coverage on water quality and all the lake's beneficial uses. For example, data collected after the application of herbicides in 2002 and 2003 to reduce nuisance macrophytes (Eurasian milfoil and coontail) demonstrated significant increases in water column nutrient concentrations and chlorophyll *a,* leading to and reflective of the excessive algae blooms that occurred after the herbicide treatment and prior to the alum treatment. Excessive algae can result in adverse impacts to recreational and wildlife beneficial uses.

While staff does not recommend the approach suggested by Leidy or Risk Sciences, Inc., we do believe that it is appropriate to revise the macrophyte coverage to 30-40% on a whole lake basis. This is based on the review and consideration of additional relevant information, including literature cited by Leidy (2006) and others (Anderson, 2006; Petr, 2000; Schneider, 2000). It appears that 30-40 % macrophyte coverage is within the range of values identified as optimal. It should be emphasized that as part of the development of the lake management plan, which is required by the proposed TMDL implementation plan, this and other targets are subject to review and revision.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) REQUIREMENTS

The basin planning process has been certified by the Secretary of Resources as functionally equivalent to the requirement for the preparation of an Environmental Impact Report or Negative Declaration. The Regional Board is required to complete an environmental assessment of any changes the Board proposes to make to the Basin Plan. Staff prepared an Environmental Checklist (Attachment B to the June 2005 TMDL Report) and revised it in the January 17, 2006 Staff Report (Attachment C), determining that there would be no significant adverse environmental impacts from the proposed Basin Plan Amendment. Staff has reviewed the environmental checklist in light of the proposed changes to the Basin Plan amendment/TMDL discussed above. No changes to the environmental checklist are warranted; the staff determination that there would be no adverse environmental impacts from the proposed amendment remains valid, provided mitigation measures are implemented.

Staff Recommendation

Adopt Resolution No. R8-2006-0023, amending Chapter 5 of the Basin Plan to incorporate the Nutrient TMDL for Dry Hydrological Conditions for Big Bear Lake shown in the Attachment to the Resolution, as amended by Errata Sheet No. 1.

References:

Anderson, M.A. 2006. E-Mail correspondence with author, 8, 9 March. Riverside, CA.

Anderson, M. A. and J. Wakefield-Schmuck. 2006. *Internal Recycling in Big Bear Lake: 2005.* Final Report to the Big Bear Municipal Water District. 20 pp.

Leidy, Roy. 2006. *Prehistoric and historic environmental conditions in Bear Valley, San Bernardino County, California.* Final report prepared for Risk Sciences. Sacramento, CA: EIP Associates.

Petr. T. 2000. Interactions between fish and aquatic macrophytes in inland waters. A review. *FAO Fisheries Technical Paper*. No. 396. Rome, FAO. 185p.

Schneider, J.C. 2000. *Evaluation of the effects of the herbicide Sonar on sport fish populations in Michigan lakes*. Fisheries Technical Report No. 2000-2. Ann Arbor, MI: Michigan Department of Natural Resources.